REMARKS

Claims 1, 2, 5, 7, 10 and 11 are currently under examination.

Rejection under Obviousness-Type Double Patenting

Claims 1, 2, 5, 10 and 11 are rejected under obviousness-type double patenting in view of Claims 1-9 of U.S. Patent Application No. 11/722,659.

Notwithstanding the present rejection, the claims of the present application remain otherwise rejected. Applicants will file a terminal disclaimer, if appropriate, upon determination of otherwise allowable claims in the present application.

Rejection under 35 U.S.C. §102(b)

Claims 1, 2, 7 and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by Lien (U.S. Patent No. 4,902,417).

The Office Action states that Lien teaches a spiral wound membrane element having all of the limitations set forth in the claims. In particular, the Office Action asserts that the feed-side channel component is fusion bonded polypropylene and is commercially available. The Office Action cites as, evidence the fusion bonded polypropylene is commercially available, the website http://www.delstarinc.com/filtration.html (a printout of which, dated October 20, 2009, is attached as Exhibit A).

Applicant submits Claim 1, 2, 7 and 11 are novel over Lien. In particular, Lien fails to expressly or inherently teach a feed-side channel component formed by fusion bonding. Moreover, the Office Action fails to provide any evidence demonstrating that fusion bonded polypropylene was commercially available.

No Evidence of Record Shows that the Feed-side Channel Spacer was Commercially Available

There is no evidence that a feed-side channel component formed by fusion bonding was commercially available. The Office Action states that DelStar Technologies provides feed-side channel spacers formed fusion bonding, and cites a website as evidence. *See e.g.,* Office Action at pg. 5; *see also* Exhibit A. However, the undated website merely lists a "Feed channel spacer" among other filtration components. The website fails to provide further details regarding the

feed channel spacer, let alone disclose a feed channel spacer formed by fusion bonding. Thus, the cited website is *not* evidence of a commercially available feed-side channel component formed by fusion bonding.

Assuming, *arguendo*, that the website discloses a feed-side channel component formed by fusion bonding, it still does not establish that the component was commercially available prior to Applicants' priority date. The website is undated, and therefore the evidence does not establish when the feed-side channel component was first disclosed or sold. Moreover, it is well-established that an undated website cannot be relied upon as a prior art reference. *See* M.P.E.P. 2128 (disclosures on the internet cannot be relied upon as prior art without evidence of the date the disclosure was publicly posted). Thus, there is no evidence of a publication or commercial sale prior to Applicant's priority date.

Accordingly, there is no evidence of record demonstrating that a feed-side channel spacer formed by fusion bonding was commercially available before Applicant's priority date. Insofar as the Office Action takes official notice that a feed-side channel component formed by fusion bonding was commercially available before Applicant's priority date, Applicants respectfully request evidentiary support, in accordance with M.P.E.P. § 2144.03 and *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). In the absence of such evidence, the rejection based upon a commercially available feed-side channel component formed by fusion bonding must be withdrawn.

Lien Fails to Teach a Feed-side Channel Component Formed by Fusion Bonding

Lien fails to expressly or inherently teach a feed-side channel component formed by fusion bonding. The Office Action fails to cite any portion of Lien expressly teaching a feed-side channel component formed by fusion bonding. Instead, the Office Action only relies upon Fig. 6, which shows a mesh, to assert Lien teaches a feed-side channel component formed by fusion bonding. Accordingly, the Office Action only relies upon a theory of inherency to assert anticipation. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *See* M.P.E.P. § 2112 (emphasis in original); *see also Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter.

1990). "The mere fact that a certain thing may result from a given set of circumstances is not sufficient." M.P.E.P. § 2112 (emphasis added); *see also In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). Thus, an assertion of inherency requires that Lien's feed-side channel must necessarily be formed by fusion bonding; it is insufficient if the feed-side channel may be formed by fusion bonding.

The Office Action fails to provide a basis for inherency because there is no evidence of record showing Lien's mesh is necessarily and always formed by fusion bonding. The Office Action alleges the structure of Lien's feed-side channel in Fig. 6 could be formed by fusion bonding. The Office Action's theory for asserting inherency is provided in response to Applicants' previous arguments. In particular, the Office Action characterizes the intersections in Lien's mesh as being consistent with fusion bonding: "[i]t would not be surprising, if the filament would melt into the ribs during the fusion bonding because the filaments have small diameter compared to the ribs." Office Action at pg. 5. However, this rationale does not demonstrate that Lien's mesh is necessarily formed by fusion bonding. At most, the Office Action asserts that Lien's mesh may be the result of fusion bonding. No assertion is made that that Lien's mesh is necessarily formed by fusion bonding, and no evidence or technical reasoning is given why the intersections in Lien's mesh would be necessarily formed by fusion bonding. For example, the intersections in Lien's mesh are consistent with shear bonding. *See e.g.*, Specification at paragraph [0006] (shear method has "nozzle holes overlap one another [during extrusion] to form a single nozzle hole at the intersection of ... yarns"). Lien cannot inherently disclose a feed-side channel component formed by fusion bonding if Lien's mesh is consistent with a feed-side channel component formed by shear bonding. Thus, the Office Action's theory for finding inherency is insufficient because the theory merely asserts that Lien's mesh may be formed by fusion bonding.

Also, there is no evidence establishing a nexus between the diameter of the filaments and fusion bonding. The Office Action's theory of inherency assumes that fusion bonding results in smaller diameter filaments melting into larger ribs at the intersections. *See* Office Action at pg. 5. Nevertheless, there is no evidence of record supporting this assumption. Insofar as the Office Action takes official notice that the fusion bonding method results in smaller filaments melting into larger ribs, Applicants respectfully request evidentiary support, in accordance with M.P.E.P.

§ 2144.03 and *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Absent such evidence, the theory of inherency has no basis in fact, and therefore the Office Action fails to provide a reasonable basis for inherency.

Accordingly, the Office Action's rationale cannot support a rejection based on inherency without further evidence or technical reasoning that shows Lien's mesh necessarily results from fusion bonding. To the extent that the Office Action takes official notice that the intersections in Lien's mesh must be formed by fusion bonding, Applicants respectfully request evidentiary support, in accordance with M.P.E.P. § 2144.03 and *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). In the absence of such evidence, the rejection based upon a theory of inherency must be withdrawn.

The Claimed Feature of "Fusion Bonding" Must be Considered For Patentability

The Office Action asserts that the claimed feature of "a net formed by fusion bonding" is "only a method of making and is not patentable in the product claim." Office Action at pg. 5. However, the claimed feature describes how the feed-side channel component is made; therefore it is a "product-by-process" claim element. "The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art." M.P.E.P. § 2113. Accordingly, the structure implied by the step of fusion bonding must be considered when assessing patentability.

Applicants have found that a feed-side channel component formed by fusion bonding "has a structure in which constituent yarns of the net are fused and bonded to each other to form intersections, and the fused and bonded portions do not protrude from the constituent yarns in a plane form." Specification at paragraph [0009]. Also, the fusion bonding method allows "the shapes of the weft and warp yarns [to be] easily [] maintained at the intersections." *Id.* at paragraph [0026]. As a non-limiting example, the net portrayed in Figure 1 of the specification is formed by fusion bonding. *See id.* at paragraph [0027].

Accordingly, it is improper to ignore the claimed feature of "a net formed by fusion bonding" for purposes of patentability. Feed-side channel components formed by fusion bonding have distinct structural features that must be considered.

Lien's Mesh is Inconsistent with Fusion Bonding

Lien's mesh is inconsistent with the fusion bonding method because Lien's mesh has the smaller filaments divided by the larger ribs at the intersection. Paragraphs [0025] to [0026] of the present specification teach:

> The fusion bonding method for forming the net generally includes the steps of extruding weft and warp yarns from a number of nozzle holes arranged at two circumferential portions (inner and outer portions) of dies in an extruder while rotating the inner and outer nozzle holes in opposite directions, fusing and bonding the weft and warp yarns to each other to form intersections, dipping them into a cooling bath, and then taking out them. In the process of performing the extrusion, **the nozzle holes are arranged such that both nozzle holes do not overlap one another at the intersections of the weft and warp yarns** (this feature differs from the shear method), and the extruded weft and warp yarns are fused and bonded to each other with appropriate timing of fusion bonding.
>
> As compared with the shear method, therefore, the **shapes of the weft and warp yarns can easily be maintained** at the intersections with no increase in the amount of extruded resin at the intersections so that the web-like deformation can be remarkably reduced and that the pressure loss of the feed-side channel can be reduced. (emphasis added)

Fig. 1 of the specification is an embodiment of a net formed by fusion bonding. *Id.* at paragraph [0026]. From these descriptions, it is clear the fusion bonding method does *not* result in a mesh having cross filaments 52 divided at the intersections with ribs 50 as shown in Fig. 6 of Lien. Consequently, Lien does not teach a feed-side channel component formed by fusion bonding.

For at least the reasons stated above, Claims 1, 2, 7 and 11 are novel over Lien. Withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. §103

Claims 5 and 10 are rejected under 35 U.S.C. §103 as being obvious over Lien in view of Boberg (U.S. Patent No. 4,213,858), Thalmann (U.S. Patent No. 6,106,715) and/or Janneck (U.S. Patent No. 4,022,692).

Claim 5

The Office Action asserts that a *prima facie* case of obviousness has been established because "multiple layers of strands for the spacer mesh is known in the art, as well as strands running at different angles." Office Action at pg. 6. Applicants respectfully disagree. None of the references, alone or combined, teach a feed-side channel component formed by fusion bonding. In addition, none of the references disclose a reverse oblique yarn.

Claim 5 is non-obvious because none of the cited references teach a feed-side channel component formed by fusion bonding. None of the references expressly disclose a feed-side channel component formed by fusion bonding, and the only teachings relied on by the Office Action are the teachings of Lien, which the Office Action indicates inherently disclose fusion bonding. As described above, the Office Action fails to establish that Lien's mesh was inherently formed by fusion bonding. As such, there is no basis for finding that any of the cited references teaches a feed-side channel component formed by fusion bonding.

Lien teaches two layer-type structures having perpendicular yarns, and therefore Lien fails to teach an oblique yarn or reverse oblique yarn. *See, e.g.,* Lien at Figure 6. Meanwhile, Janneck teaches two layer-type structures having oblique yarns, but does not teach reverse oblique yarns. *See, e.g.,* Janneck at Fig. 1 (yarn **20** is perpendicular to axis of tubular membrane and yarn **18** is oblique to axis of tubular membrane). Boberg teaches yarns that only intersect at right angles and therefore Boberg fails to teach oblique yarns and reverse oblique yarns. *See, e.g.,* Boberg at Figures 1-4. Finally, Thalmann teaches a structure having yarns that "form generally rectilinear lattice openings," Thalmann at col. 2, lines 38-46, and therefore Thalmann fails to teach oblique yarns or reverse oblique yarns. Accordingly, none of the cited references, or any combination thereof, teach a reverse oblique yarn.

Moreover, no combination of these references would yield the claimed structure. The references either teach a two layer-type structure (Lien and Janneck) or a structure in which two of the yarns are parallel (Boberg and Thalmann). In no instance does any reference teach three yarns of different orientation. As such, it is not possible to combine the cited references to arrive at a three-layer type having a warp yarn, oblique yarn, and reverse oblique yarn. Therefore, no combination of the cited references teaches all elements of Claim 5.

Moreover, the Office Action provides no reason for modifying any of the cited references to include the reverse oblique yarn. "The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious ... [T]he analysis supporting a rejection under 35 U.S.C. 103 should be made explicit." M.P.E.P. 2141(III). Because no explicit rationale is provided for modifying the cited references to obtain the untaught feature, a *prima facie* case of obviousness cannot be made. Moreover, no such rationale can be identified in the cited references because the references, alone or combined, fail to provide any reason for modifying the structures provided therein to arrive at a membrane with the claimed configuration. Accordingly, the claims are not *prima facie* case of obvious over the cited references.

Also, Applicants have surprisingly found a spiral separation membrane element having a feed-side channel component with warp yarns, oblique yarns and reverse oblique yarns results in unexpected superior properties. In particular, the pressure loss caused by the feed-side channel component is surprisingly low. Example 4 of the specification shows that the feed-side channel component provides about a 60% lower pressure drop compared to other feed-side channel components.

For at least the reasons stated above, Claim 5 is non-obvious over the cited references. Withdrawal of the rejection is respectfully requested.

Claim 10

Claim 10 is non-obvious over the cited references because the cited references fail to teach a feed-side channel component formed by fusion bonding. Also, the cited references teach away from any combination that would lead to the claimed membrane element.

Claim 10 is non-obvious because none of the cited references teach a feed-side channel component formed by fusion bonding. None of the references expressly disclose a feed-side channel component formed by fusion bonding, and the only teachings relied on by the Office Action are the teachings of Lien, which the Office Action indicates inherently disclose fusion bonding. As described above, the Office Action fails to establish that Lien's mesh is inherently formed by fusion bonding. As such, there is no basis for finding that any of the cited references teaches a feed-side channel component formed by fusion bonding.

Moreover, the cited references teach away from any combination that would lead to the claimed membrane element. Lien and Janneck teach two layer-type structures. *See, e.g.,* Lien at Figure 6 and Janneck at Figure 5. Thus, no combination of Lien and Janneck alone can render Claim 10 obvious. Further, Janneck cannot be combined with Thalmann because the teachings of Janneck and Thalmann are incompatible. Thalmann teaches improving performance by minimizing the contacting surface area between the membrane and the feed-side channel component by having only the warf yarns contact the membrane. Thalmann at column 2, lines 25-37. In contrast, Janneck teaches a two layer-type spacer where the weft yarn forms an oblique angle, and teaches the benefit of the weft yarn contacting the membrane:

> As perhaps best visualized with reference to FIG. 3, the blood 23 flowing through each blood channel 26 of the blood compartment (membrane 12) assumes a thin layer configuration with **the surface of the membrane 12 in contact with the filaments 18** undergoing a limited sinusoidal distention and the opposite surface of **the membrane in contact with the filaments 20** being substantially fully supported to undergo only a very slight distention. **Thus, masking (surface to surface contact between distended membrane layers) of the membrane 12 between overlying channels 26 is minimized to substantially maximize the surface area of the membrane 12 which is exposed to the exchange fluid.** *Janneck* at column 4, lines 36-48.

Thus, Janneck teaches contact between the membrane and both filaments 18 and 20 in order to minimize membrane masking to maximize surface area exposure to exchange fluid. Accordingly, while Thalmann teaches having only warf yarns contact the membrane, Janneck, in contrast, teaches the importance of weft yarns also contacting the membrane. As such, for one of ordinary skill to follow the teachings of Janneck, it is necessary to proceed contrary to the teachings of Thalmann, and *vice versa*. It is improper to combine references where the references teach away from their combination. M.P.E.P. §2145.X.D.2*; see also In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). The teachings of Janneck and Thalmann teach away from their combination. Accordingly, it is improper to combine the teachings of Janneck and Thalmann.

Furthermore Lien and Janneck cannot be combined with Boberg to render Claim 10 obvious because the teachings of Janneck and Boberg are incompatible. As stated above, no combination of Lien and Janneck alone can render Claim 10 obvious. Janneck cannot be combined with Boberg because Boberg teaches the advantages of a rectangular arrangement of

yarns, while Janneck teaches the advantages of a bilayer with filaments intersecting at oblique angles. Specifically, Boberg teaches:

> Referring to FIG. 1, the supporting net in accordance with the present invention comprises an outer layer of **first strands** 1a spaced apart and substantially parallel to each other, an intermediate layer of **second strands** 1c spaced apart and substantially parallel to each other but **substantially perpendicular to the first strands** 1a, and an inner layer of **third strands** 1b spaced apart and substantially parallel to each other and **substantially parallel to the first strands 1a**. *Boberg* at column 4, lines 7-15.

Thus, Boberg teaches that Boberg's invention is directed to a supporting net containing perpendicular strands. In contrast, Janneck teaches:

> An improved non-woven support screen for mass transfer devices including a **first set of parallel spaced longitudinally extending filaments** having a predetermined thickness or diameter and a **second set of parallel spaced filaments obliquely arranged relative to the first set of filaments** and having a predetermined thickness or diameter approximately 1/2 that of the first set of filaments to provide improved control of membrane distention for minimizing the masking of the membrane surface by preventing excessive distention in one plane, to reduce the volume of body fluid layer in the membrane (low prime), and provide improved mass transfer efficiency while maintaining gentle mixing of the body fluid. *Janneck* at Abstract.

Thus, Janneck teaches the importance of a bilayer with filaments intersecting at oblique angles. Accordingly, while Boberg teaches the importance of filaments arranged perpendicularly, Janneck, in contrast, teaches the importance of a bilayer with filaments intersecting at oblique angles. As such, for one of ordinary skill to follow the teachings of Janneck, it is necessary to proceed contrary to the teachings of Boberg, and *vice versa*. Since the teachings of Janneck and Boberg teach away from their combination, it is improper to combine the teachings of Janneck and Boberg.

As seen above, Lien and Janneck cannot be combined with Thalmann or Boberg because the teachings of Thalmann and Boberg are incompatible with the teachings of Janneck. Since Lien and Janneck teach only two layer-type structures, no combination of Lien and Janneck alone can render Claim 10 obvious. Further, since Lien and Janneck cannot be combined with Thalmann or Boberg, the teachings of Lien and Janneck, absent more, cannot render Claim 10 obvious. Therefore, the cited references cannot render Claim 10 obvious.

The Office Action asserts the incompatibility of the cited references is unpersuasive because there is a motivation for combining the references. Office Action at pg. 7. Even if motivation asserted by the Office action exists, Applicant's rebuttal arguments must nevertheless be considered. M.P.E.P § 2145. Evidence that references teach away from their combination may rebut a *prima facie* case of obviousness. M.P.E.P. § 2145.X.D.2. "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention." M.P.E.P. § 2141.02.VI; *see also W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Thus, portions of the cited references teaching away from their combination cannot be ignored simply on the rationale that other portions may provide a motivation to combine. "Office personnel should not ... summarily dismiss [rebuttal evidence] as not compelling or insufficient." M.P.E.P § 2145. The Office Action fails to consider any teaching away by the references, and, therefore, fails to consider the cited references as a whole. Because no basis is provided why Applicant's rebuttal arguments are unpersuasive, the rejection is improper.

For at least the reasons stated above, Claim 10 is non-obvious over the cited references. Withdrawal of the rejection is respectfully requested.

CONCLUSION

The present application is believed to be in condition for allowance, and an early action to that effect is respectfully solicited. Applicants invite the Examiner to call the undersigned if any issues may be resolved through a telephonic conversation.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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Dated: October 20, 2009

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